

Notice of Allowability**Application No.**

10/583,158

Applicant(s)

LI ET AL.

Examiner

AJIBOLA AKINYEMI

Art Unit

2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 03/16/2011.
2. ☒ The allowed claim(s) is/are 1-5, 7-12 and 14-18.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 03/16/2011.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Bishop, Steven on 03/16/2011.

Please amend the claim as below:

5. (Currently Amended) In a wireless communication system of cells, base stations, and mobile stations, a method of transmitting ranging signals by a mobile station to a base station for initiating a random access and establishing communication between the mobile station and the base station, wherein the base station uses the ranging signals to identify the mobile station, determine the mobile station's signal power, and measure the mobile station's time delay, the method comprising: constructing ranging subchannels:

wherein a ranging subchannel includes at least one block having
~~multiple~~ a plurality of subcarriers;

wherein the subcarriers in a block are contiguous in frequency; ~~and~~
wherein power of a block is shaped by assigning different signal
power levels to different subcarriers of the block;

wherein a signal power towards both frequency boundaries of a
subcarrier block is lower than a signal power of subcarriers
towards the center of the block; and

assigning specific block configurations to ranging subchannels for each cell;
and
transmitting binary or non-binary ranging signals over the ranging subchannels by modulating the plurality of subcarriers, wherein a sequence of modulating signals in a ranging subchannel is a ranging sequence, and wherein each ranging signal has low peak-to-average power ratio in the time domain.

Claim 6 have been currently cancelled.

11. (Currently Amended) The method of claim 5, wherein ~~a~~the sequence of modulating signals ~~of a ranging subchannel, in time domain, can be is~~ approximated by a binary sequence for reducing complexity of a receiver correlator, ~~and wherein the ranging signal has low peak-to-average power ratio.~~
12. (Currently Amended) In a network of base stations and remote stations, a remote station transmitter configured to transmit ranging signals for initiating communication with the base station, wherein the base station uses ranging signals to identify the remote station and determine at least one transmitter attribute, the transmitter comprising:
- a facility for constructing ranging subchannels:
 - wherein a ranging subchannel comprises ~~multiple~~ a plurality of subcarrier blocks;
 - wherein the subcarriers of a block are contiguous in frequency; and

wherein different power levels are assigned to different subcarriers of the block; and wherein a power level towards the high-end and low-end frequency boundaries of a subcarrier block is lower than a signal power of subcarriers towards the center of the block, or wherein a power level of the two subcarriers at both ends of a subcarrier block is zero;

a modulator for modulating binary or non-binary ranging signals on the subcarriers of the ranging subchannels,
wherein a sequence of modulating signals in a ranging subchannel is a ranging sequence; and
wherein each ranging signal has low peak-to-average power ratio in the time domain.

Claim 13 have been currently cancelled.

18. (Currently Amended) The transmitter of claim 12, ~~wherein a sequence of all modulating signals in a ranging subchannel is a ranging sequence, and~~ wherein a time-domain signal corresponding to the ranging sequence is associated with a binary sequence ~~and wherein the ranging signal has low peak-to-average power ratio.~~

Claims 23-27 have been currently cancelled.

REASON FOR ALLOWANCE

1. Claims 1-5, 7-12, 14-18 are allowable over cited prior art.

2. The following is an examiner's statement of reasons for allowance: The cited prior art does not disclose modulating, in the mobile station, ranging signals on at least one ranging subchannel: wherein the ranging subchannel includes multiple subcarrier blocks wherein subcarriers in each subcarrier block are contiguous in frequency; wherein ranging subchannels associated with the base station employ predetermined block configurations; and a sequence of all modulating signals in a ranging subchannel is a ranging sequence; estimating by the mobile station, using a received downlink signal from the base station, a path loss between the base station and the mobile station; setting a power level of the ranging signals by an open-loop power control, wherein the mobile station adds a negative offset to the open-loop power setting to begin sending the ranging signal and gradually increases power as a number of failures and retries increases; detecting, by the base station, a presence of the ranging signal, a time delay, and the power level, wherein the detection process comprises: applying Fast Fourier Transform (FFT) to a selected window of the ranging signal; correlating, in the frequency-domain, stored ranging sequences with the ranging signal, wherein the correlation is performed segment-wise, and wherein each segment of the correlation is performed on the subcarrier block using a correlation result to detect and identify the ranging signal; and correlating, in the time-domain, the identified ranging signal with a corresponding one of the stored ranging sequences, in a sliding-window fashion, to determine the time delay and power level of the ranging signal.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AJIBOLA AKINYEMI whose telephone number is (571)270-1846. The examiner can normally be reached on monday- friday (8.30-5pm) Est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DUC NGUYEN can be reached on (571) 272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/A. A./
Examiner, Art Unit 2618

/DUC NGUYEN/
Supervisory Patent Examiner, Art Unit 2618